APPENDIX U: TRAINING GUIDE - LADDER SAFETY

Effective dissemination of safety information is an integral part of the Injury and Illness Prevention Program. This document was created to facilitate worker safety training. Training must be completed before the use of any tool or piece of equipment, exposure to any hazardous conditions, and/or when new hazards are identified.

In Preparation for this meeting (items needed):

- Training Documentation Form
- Ladder Inspection Checklist

Introduction

Ladders are tools commonly used in shops. When maintained properly and used according to safety guidelines, they are a simple and effective tool. However, every year thousands of workers are injured or killed due to ladder-related accidents. Cal/OSHA requires employers to provide safety guidelines for working with ladders and requires that ladders be in good condition and free of damage. This helps to prevent ladder-related accidents. It is the responsibility of the employee to follow safety guidelines and to report any damaged or unsafe ladders in the workplace. A fall from a ladder can be serious, but this can be avoided by working safely on or around ladders.

Types of Ladders

Ladders can be constructed from a variety of materials such as wood, metal, and reinforced plastic. They usually consist of two side rails that are joined at regular intervals called rungs or steps. Generally, ladders do not have moving parts, except for extension ladders which have ropes, pulleys, and ladder locks. Some ladders have additional safety features, such as roof hooks or adjustable feet that make the ladder more stable. Generally there are four types of ladders:

4 Types of Ladders	Portable	Adjustable	Self-Supporting
1) Step Ladder	YES	NO	YES
2) Straight Ladder	YES	NO	NO
3) Extension Ladder	YES	YES	NO
4) Fixed Ladder	NO	NO	YES

Discussion Topics:

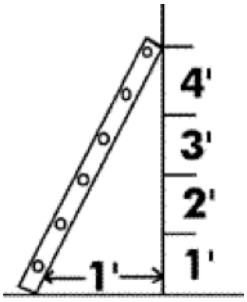
- Each type of ladder has unique features that ensure safety in the workplace.
- Talk about the various job tasks that are performed in your workplace using ladders.
- What types of ladders are in the shop?

Ladder Selection

Selecting the appropriate ladder for the job can greatly reduce your chances of being involved in an accident. The following four things must be considered when selecting a ladder:

1) Height Requirement

The average worker can work comfortably at shoulder level, which is about five feet above where he/she stands. Since the worker must stand at least two feet down from the top of a ladder, the maximum working height would be about three feet above the top of the ladder. For example, a five-foot stepladder would give an effective working height of eight feet.



Ladder Safety 1:4 Rule

When using straight or extension ladders, the worker must follow the one quarter rule to calculate the height of the ladder needed. This is also referred to as the 1:4 rule for ladder safety. The rule states that the base of the ladder must be one foot away from the structure for every four feet of height to where the ladder rests against the structure. The length of the ladder can then be calculated with the formula $A^2 + B^2 = C^2$, where A and B are the length of the structure and base, and C is the length of the ladder. Keep in mind an additional three feet must be added to the length of the ladder to ensure adequate overlap.

2) Weight Capacity

Weight capacity is also a key element to consider when selecting a ladder. Ladders can break or give way under excessive weight stress. When evaluating the stress to be placed on a ladder, remember to factor in additional equipment, such as tools and personal protective equipment. If a person's body weight plus tools and equipment exceed the weight capacity of the ladder, then use a ladder with a higher weight capacity or use an alternative means of transporting the tools and equipment, such as a rope or tow line. Ladders are usually classified into classes called duty rating as follows:

Class	Duty Rating & Recommended Use
IAA	375 pounds; extra heavy-duty industrial use
IA	300 pounds; extra heavy-duty industrial use
I	250 pounds; heavy-duty use
II	225 pounds; medium-duty use
III	200 pounds; light-duty use

3) Surface Conditions

Various surface conditions can lead to falls when using ladders. If the surface is uneven, use optional foot attachments that are designed to level the feet of the ladder. If the surface is hard or smooth, choose a ladder with non-skid feet and take extra precautions, such as asking a coworker to hold the ladder in place.

4) Hazardous Environment

When selecting a ladder, be sure to check for hazards, such as exposed electrical equipment or power lines. If electrical hazards exist in the working area, choose a non-conductive ladder such as a wood or reinforced plastic ladder. Also, maintain a distance of at least 10 feet from the electrical equipment or power lines.

Discussion Topics:

- Discuss how height, weight, floor surface, and the environment can lead to dangerous work conditions.
- Are all employees aware of how to choose the appropriate ladder?
- What would be the height of the ladder needed for a 12-foot building using the one quarter rule?

Ladder Inspection

Once you have selected the right ladder for the job, it is important to conduct a visual and operational inspection. Ask yourself: are the steps free of oil, grease, and dirt? If ropes are attached, are they in good condition? Are there any signs of structural damage such as cracked side rails or broken parts? Are the support braces intact? If for any reason the ladder does not pass the inspection, make sure to tag it and remove it from service immediately.

Discussion Topics:

- What are employees looking for during the ladder inspection?
- Is the ladder inspection checklist utilized for documentation?
- Take the time now to complete the ladder inspection checklist for each of the ladders in your workplace.

Ladder Set up and Use Rules

Place ladder feet firmly and evenly on the ground or floor. Make sure the ladder is sitting straight and secure before climbing it. If one foot sits in a low spot make sure to readjust or use feet leveling attachments. Do not try to make a ladder reach farther by setting it on boxes, blocks or other unstable bases. If there is danger of slippage, ask a coworker to hold the ladder steady. Never set up or use a ladder in a high wind, especially a lightweight metal or fiberglass type. Never set up a ladder in front of a door unless the door is locked or a guard is posted.

Always follow these rules when using a ladder:

- Always face the ladder when climbing up or down.
- Never climb the backside of a step ladder.
- Never use the top two rungs on a step ladder.
- Never use the top three rungs on straight or extension ladders.
- Never use a ladder for scaffolding.
- Never attempt to reposition a ladder while in use.
- Do not reach beyond your arm's normal extension.
- Never hurry up a ladder and keep three points of contact at all times.

Discussion Topics:

- What techniques are your employees using to set up ladders in your workplace?
- What other rules are followed in your workplace to ensure safety?

Ladder Storage and Maintenance DOs & DON'Ts

Do's	Don'ts
Maintain ladders in good condition.	Never paint a wooden ladder as this will cover dangerous cracks or fill and hide them.
Keep all ladder accessories, especially safety shoes, in good condition.	Never use a metal or fiberglass ladder which has been exposed to fire or strong chemicals, it should be discarded.

Do's	Don'ts
Store fiberglass ladders where they will not be exposed to sunlight or other ultraviolet light sources.	Never store materials on top of a ladder. Vibration and bumping against other objects can damage them.
Be sure that ladders are properly supported and secured when in transit.	Never use a damaged ladder. Damaged ladders must be removed from service.
Restrain/store ladders on racks to prevent them from falling over when not in use.	Never store ladders near entrances or exits as they may fall and block emergency pathways.

Discussion Topics:

- How are your ladders stored in your workplace?
- What type of maintenance is needed for the ladders in your workplace?

Key Takeaway Points

- Know about the different types of ladders and their intended use.
- Know ladder height requirements.
- Know duty ratings and labeling.
- Know how to conduct a ladder inspection to ensure that ladders are safe to use.